REMARKS

Claims 1-4, 6-13, 15, 22-27, 29-31 and 49-57 are currently pending in the present application.

On pages 2-4, section 4 of the Office Action, claims 1-4, 6-13, 15, 22-27, 29-31 and 49-57 were rejected under 35 U.S.C. 103(a) as being unpatentable over Jonsson in "Advanced Water Recycling System Required For New South African Mill", or Panchapakesan in "Closure of Mill Whitewater Systems Reduces Water Use, Conserves Energy", or Guss in "Closed Water Systems in Mills Using Secondary Fiber" or Hoffman et al. (US Patent No. 6,071,380), in view of Nagarajan et al. (EP 0805234), further evidenced by Satterfield et al. (U.S. Patent No. 5,755,930) or Blanko et al. in "Predicting the impact of closing the water system in paper mills." This rejection is respectfully traversed.

The Jonsson, Guss, Panchapakesan and Hoffman references describe the closure of the water system for paper mills but do not teach, suggest or disclose that closure leads to a high conductivity in the cellulosic suspension, let along specific conductivities for the white water. This is also noted in the Office Action on page 3, lines 7-8, which states as follows:

> *"none of the above cited references explicitly disclose the conductivity"*

Satterfield discloses improved retention for "dirty" suspensions and that prolonged recycling of white water may contribute to the suspensions being "dirty." Satterfield teaches that the "dirty" suspension can be such that the white water has conductivity above about 1,000, and preferably above about 1,500 micro Siemens, often 2,000 to 3,000 micro Siemens. However, Satterfield is completely silent with regard to using a cationic organic polymer having an aromatic group.

Blanco is directed to the impact of closing the water system in paper mills. Blanco discloses in Table I on page 436 that "typical" compositions of white water have conductivities in the range of 3-11 mS/cm. However, Blanco is silent as to the source of the data, including the number of mills sampled and the reason for the high conductivity. Moreover, on page 437 under "Inorganic ions," Blanco states that the normal range of conductivities is 500 to 10,000 μS/cm, i.e. 0.5-10 mS/cm. Thus, it is respectfully submitted that the reason for the high conductivities in the white water is likely from high levels of inorganic ions present at the sampled mills. Moreover, Blanco is completely silent with regard to using a cationic organic polymer having an aromatic group.

Regarding the teachings of Blanco, the European Opposition Division, in the European Opposition proceeding for corresponding European patent EP-B-1080272, found it reasonable to assume that the high conductivities (disclosed by Blanco (ref. D10' in the Opposition)) originates from extremely high levels of ionic impurities, e.g. Ca^{2+}, and stated that it is well known that such water sources can be found, for example, on the Iberian peninsula. See Decision from Opposition Division at pages 6-7 (attached hereto as Ex. A). The Decision ultimately rejected the opposition finding that none of the cited references suggest the application on high conductivity suspensions of aromatic group containing polymers.

The European Opposition Division's analysis of Blanco is further supported by the declaration of John Nicholass, which was submitted in the European opposition proceeding (a copy of which is attached hereto as Ex. B). In his declaration, Mr. Nicholass provides information about conductivity data from 1998 to 1999 that has been compiled from 188 commercial paper and board making applications using white water recirculation, in different countries and regions throughout the world. A review of the data reveals that the applications in the Iberia region tend to have high conductivities. Further, the data shows that the vast majority of applications using white water recirculation have conductivities under 2.4 mS/cm.

This is also supported by the declaration of Hans Hallstrom, which was previously filed on February 5, 2003, in response to the Office Action dated September 5, 2002, and which provided conductivity data from 20 European, North American and Japanese paper machines commercially producing paper from processes that included white water recirculation. The data shows that the majority (or approx. 80%) of the mills were commercially producing paper from cellulosic suspensions having conductivity levels in range of 500-1800 μS/cm. Therefore, Applicants respectfully submit that the prior art, when read as a whole (including Satterfield and Blanco), teaches one skilled in the art that, although a paper making process that includes white water recirculation may include a suspension having conductivity in the claimed range, the vast majority of such processes will include suspensions having a conductivity out side of the claimed range.

Further, none of the Jonsson, Guss, Panchapakesan, Hoffman, Satterfield or Blanco references disclose or suggest the cationic polymers claimed in the present invention. This is also acknowledged in the Office Action, at page 3, line 14, where it states as follows:

> *"None of the above reference[s] teaches also the cationic organic polymer as claimed"*

Nagarajan relates to a paper making process that comprises adding to a cellulosic suspension a dispersion polymer and microparticles. The polymer can be a cationic polymer with an aromatic group or a non-aromatic polymer. Nowhere does Nagarajan teach or suggest using a cationic polymer having an aromatic group in a suspension having a conductivity in the range of 2.4-10.0 mS/cm, as claimed.

It is the invention as a whole, and not some part of it, which must be obvious to support a rejection under 35 USC §103(a). *In re Antonie*, 195 USPQ 6, 8 (CCPA 1977). The unsuggested recognition of a relationship between the result produced and the particular design parameters is the touchstone of nonobviousness. A process is

unobvious in cases where optimizing a known result-effective variable produces unexpectedly good results or where the art did not recognize that the parameter optimized was a result-effective variable. *Id.* at 8-9.

In the instant case, optimizing the conductivity within the range of 2.4-10.0 mS/cm in connection with the cationic polymer (containing an aromatic group), as claimed, provides unexpectedly good retention and dewatering effects. This is confirmed by the examples of the present invention. In that regard, the examples of the present invention show that at higher conductivities, i.e, 2.4 and 2.5 (ex. 7 and ex. 8) and 5.5-10mS/cm (ex. 3) the aromatic cationic polymer shows both better retention and dewatering effect. Nowhere does Nagarajan suggest or recognize such a relationship.

In fact, Nagarjan actually teaches away from using an aromatic cationic polymer to improve retention. In example 2 of Nagarajan it is shown that the **non-aromatic cationic polymer** gives **better retention** compared to the aromatic cationic polymer. This is also confirmed by the examples of the instant application, which show that at low conductivities, 0.47 and 1.375 mS/cm (ex. 1 and 2), the performance of the non-aromatic cationic polymer is better than the aromatic cationic polymer.

One of ordinary skill in the art with the aim to improve retention when using a high conductivity stock, absent any teaching, disclosure or suggestion that a particular polymer is better for such stock, would be motivated to choose the polymer with the best performance known in the prior art. As has been described above, Nagarajan teaches that the non-aromatic cationic polymer gives the best retention. Thus, Nagarajan actually teaches away from the claims of the present application and there is no teaching, suggestion or disclosure to motivate the skilled person to use the non-preferred polymer of Nagarajan to improve retention in a high conductivity stock.

There is nothing in the cited prior art that would lead a person of ordinary skill to choose a polymer that does not give the best performance solely because a high conductivity stock is used. Further, there is nothing in the prior art showing that one of

ordinary skill in the art would be able to foresee the difference in performance between the non-aromatic and aromatic cationic polymer at high conductivity stocks. Applicants submit that only applicant's disclosure provides any motivation for combining the isolated disclosures of the cited references in the manner combined in the Office Action.

Therefore, Applicants respectfully request the rejection of claims 1-4, 6-13, 15, 22-27, 29-31 and 49-57 under 35 U.S.C. 103(a) as being unpatentable over Jonsson, Panchapakesan, Guss or Hoffman, in view of Nagarajan, further evidenced by Satterfield or Blanko, be withdrawn.

On pages 4-5, section 5 of the Office Action, claims 1-4, 6-13, 15, 22-27, 29-31 and 49-57 were also rejected under 35 U.S.C. 103(a) as being unpatentable over Jonsson, Panchapakesan, Guss or Hoffman, in view of Pearson (US Patent No. 5,466,338), further evidenced by Satterfield or Blanko.

As discussed above, Jonsson, Guss, Panchapakesan and Hoffman describe closure of the water system for paper mills but do not teach, suggest or disclose that closure leads to a cellulosic suspension having the claimed conductivity. Further, although Satterfield and Blanco disclose that closure **may** result in high white water conductivity, white water recirculation does not necessarily result in a cellulosic suspension having the claimed conductivity, and, if fact, the vast majority of paper processes that include white water recirculation do not result in a cellulosic suspension having the claimed conductivity.

Pearson discloses dispersion polymers useful for coagulating white pitch from coated broke slurries and does not teach, suggest, or disclose suspensions having the claimed conductivity. The problems solved by Pearson are the problems in connection with recycling of coated broke and sticky deposits referred to as "white pitch". Pearson does not mention any problems in connection with high conductive suspensions and is silent with regard to recycling white water or improving retention of a suspension that is

formed and dewatered on a wire. Pearson teaches that the polymer is added to treat coated broke slurry before it is recycled to the paper machine. (See col. 3, lines 46-48).

Pearson merely teaches that white pitch is associated with recycled coated broke. Although paper processes with closed water systems may include recycled coated broke, Applicants submit that such processes (containing recycled coated broke) are independent from the conductivity of the suspension, i.e., they can include suspensions having low or high conductivities. Nowhere does Pearson suggest or motivate one skilled in the art to include the disclosed dispersion polymers in a paper process that includes a suspension having the claimed conductivity.

Applicants respectfully submit that the claimed process is not obvious in view of Pearson, in combination with the other cited references, since there is no suggestion or recognition by Pearson (or any of the cited references) of a relationship between the improved retention and dewatering and use of the aromatic polymer at high conductivities, as claimed. See *In re Antonie*, 195 USPQ at 8-9. It is Applicants who found that using the aromatic cationic polymer according to the claims unexpectedly provides improved performance at high conductivities.

Thus, it is respectfully submitted that none of the cited references when read alone or combined teach or suggest adding a cationic polymer to a suspension having a conductivity between 2.4 and 10.0 mS/cm, as claimed.

Therefore, Applicants respectfully request the rejection of claims 1-4, 6-13, 15, 22-27, 29-31 and 49-57 under 35 U.S.C. 103(a) as being unpatentable over Jonsson, Panchapakesan, Guss or Hoffman, in view of Pearson, further evidenced by Satterfield or Blanko, be withdrawn.

Accordingly, Applicants respectfully submit that the application, including claims 1-4, 6-13, 15, 22-27, 29-31 and 49-57, is in proper form for allowance, which action is earnestly solicited. If resolution of any remaining issue is required prior to allowance of

the application, it is respectfully requested that the Examiner contact Applicants' undersigned attorney at the telephone number provided below.

Respectfully submitted,

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